

[KICK WARNING SYSTEM USING HIGH FREQUENCY FLUID MODE IN A BORE-HOLE]

Abstract

Techniques for detecting a kick in a borehole include acquiring a set of measurements with a sonic tool in the borehole; determining borehole mud slowness from the set of measurements; and comparing the mud slowness with a selected criterion, wherein the determining the mud slowness includes determining fluid mode slowness as a function of frequency for at least one fluid mode, and determining the mud slowness from the fluid mode slowness.